



FilmTec™ LiNE-XD

High Productivity Nanofiltration Membrane Element for Lithium-Brine Purification

Key Features

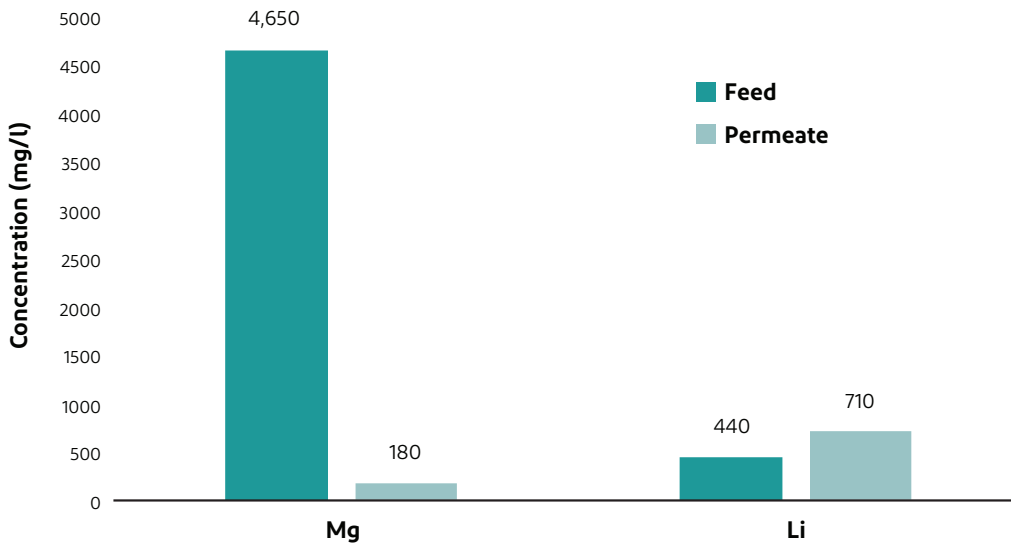
- High monovalent-divalent ion selectivity to enable (multivalent) impurity removal from direct lithium extraction (DLE) brine stream prior to lithium concentration step.
- State of the art membrane chemistry to offer high lithium passage for typical chloride-rich Li-brine stream.
- Expertly designed and optimized membrane chemistry to enable a reliable and robust element lifetime.
- High productivity membrane allows for increased water and lithium recovery and/or reduced energy consumption.
- Dry element availability enables easy transportation and handling.

Key Applications

- Lithium stream purification in chloride-rich brine mining from salt lake brine, geothermal brine, oilfield produced water, etc.
- Lithium stream purification in (modified) sulfate-rich brine extracted from surface clay, sub-surface clay, battery recycle stream, etc.

Exemplary performance of Li-Mg separation by Filmtec™ LiNE-XD

Cation concentration (mg/l) in feed/permeate



1. Results are according to a single-element test for treating a typical DLE NF feed stream mainly including LiCl, MgCl₂, and NaCl.

- Temperature: 25°C
- pH 3.3
- Membrane flux: 15lmh
- Recovery: 15%

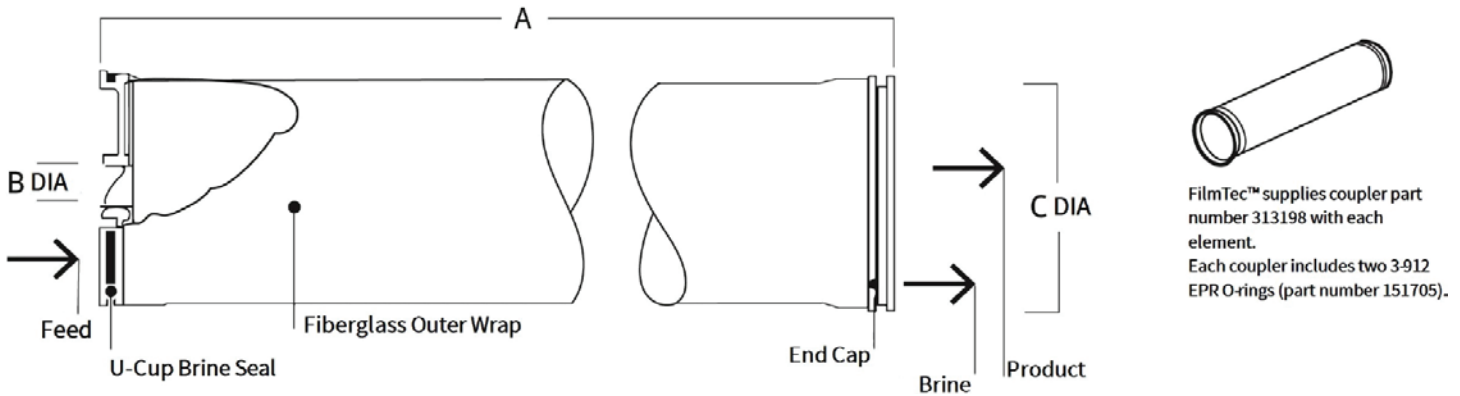
2. No warranty is provided for the application of this information since use conditions and applicable laws may differ from one location to another and may change with time.

Typical Properties

FilmTec™ Element	Active Area ft² (m²)	Feed Spacer Thickness (mil)	Permeate Flow Rate gpd (m³/d)	Stabilized Salt Rejection (%)	Minimum Salt Rejection (%)
LiNE-XD	400 (37)	34	9,025 (34)	99.2	98.0

1. Permeate flow and salt rejection based on the following standard conditions: 2,000 ppm MgSO₄, 70 psi (4.8 bar), 77°F (25°C), pH 8, and 15% recovery.
2. Flow rates for individual elements may vary but will be no more than 15% below the value shown.
3. Sales specifications may vary as design revisions take place.

Element Dimensions



FilmTec™ Element LiNE-XD Dimensions	inches	mm
A	40.0	1,016
B	1.125 ID	29
C	7.9	201

1. For element weight information refer to [What is the weight of FilmTec™ elements as delivered?](#)
2. For element packaging and shipping information refer to [How are FilmTec™ elements packaged and shipped?](#)

Suggested Operating Conditions

General	Details	
Membrane Type	Nanofiltration Thin-Film Composite	
Maximum Operating Temperature ¹	113°F	45°C
Maximum Operating Pressure	600 psig	41 bar
Maximum Pressure Drop		
Per Element	15 psig	1.0 bar
Per Pressure Vessel (Minimum 4 Elements)	50 psig	3.5 bar
pH Range		
Continuous Operation ¹	3 - 10	
Short-Term Cleaning (30 min.) ²	1 - 12	
Maximum Feed Flow ³	75 gpm	17 m³/hr
Maximum Feed Silt Density Index	SDI 5	
Free Chlorine Tolerance ⁴	< 0.1 ppm	

1. Maximum temperature for continuous operation above pH 10 is 95°F (35°C).
2. Refer to [FilmTec™ Cleaning Guidelines](#) (Form No. 45-D01696-en).
3. For recommended feed and permeate flow rates, flux, and recovery for various feed sources, refer to [FilmTec™ Design Guidelines for multiple-element systems of 8-inch elements](#) (Form No. 45-D01695-en).
4. Oxidation damage is not covered under warranty, DuPont recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to [Dechlorinating Feedwater](#) (Form No. 45-D01569-en) for more information.

General Information

- Keep elements moist at all times after initial wetting.
- For successful operation of Reverse Osmosis (RO) and Nanofiltration (NF) membrane systems, the operation must follow the guidelines provided in the [FilmTec™ Reverse Osmosis / Nanofiltration Elements Operation Excellence and Limiting Conditions Tech Fact](#) (Form No. 45-D04388-en).
- To prevent biological growth during prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution.
- The customer is fully responsible for the effects of incompatible chemicals and lubricants on elements.
- Avoid static permeate-side backpressure at all times.
- Permeate obtained from the first hour of operation should be discarded.
- The use of this product in and of itself does not necessarily guarantee the removal of cysts and pathogens from water. Effective cyst and pathogen reduction is dependent on the complete system design and on the operation and maintenance of the system.

Important Information

Please consider good operating practices for the optimal performance of the Nanofiltration membrane elements to assure damage free operation:

1. [Loading of Pressure Vessels - Preparation & Element Loading](#) (Form No. 45-D01602-en)
2. System Operation, including plant [Start-Up Sequence](#) (Form No. 45-D01609-en) and [RO & NF Systems Shutdown](#) (Form No. 45-D01613-en)
3. [Handling, Preservation, and Storage](#) (Form No. 45-D03716-en)

Full information of plant design, system operation, and troubleshooting is given in the [FilmTec™ Reverse Osmosis Membranes Technical Manual](#) (Form No. 45-D01504-en).



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